Notes on the Neotropical genus *Dirphiopsis* Bouvier, 1928 with description of a new species (Lepidoptera: Saturniidae, Hemileucinae, Hemileucini)

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Abstract: *Dirphiopsis* ***brockmanni*** **n. sp.,** from Central-eastern Brazil, is described and compared to its similar species *Dirphiopsis ayuruoca* (Foetterle, 1902), from Southeastern Brazil, differing from the latter by the larger size, smaller anterior stigma, postmedial line and uncus and bulbus ejaculatorius of the male genitalia. The male holotype is deposited in the collection Padre Jesus S. Moure, Departamento de Zoologia, Universidade Federal do Paraná, Curitiba, Paraná, Brazil. The status of *Dirphiopsis lombardi* (Bouvier, 1924) **stat. rev.** is raised to species rank. *Dirphiopsis tripicata* (F. Johnson, 1937) **n. stat., n. syn.** is removed from synonymy of *Dirphiopsis ayuruoca* and found to be a new synonym of *Dirphiopsis picturata* (Schaus, 1913).

Key words: Distribution, taxonomy, new synonymy.

Anmerkungen über die neotropische Gattung *Dirphiopsis* Bouvier, 1928 mit Beschreibung einer neuen Art (Lepidoptera: Saturniidae, Hemileucinae, Hemileucini)

Zusammenfassung: Eine neue Art der Gattung *Dirphiopsis* Bouvier, 1928 wird beschrieben. *Dirphiopsis* ***brockmanni*** **sp. n.** kommt in Zentral-Ostbrasilien vor und ähnelt *Dirphiopsis ayuruoca* (Foetterle, 1902), von der sie sich unterscheidet durch die größere Spannweite, kleinere Vorderflügelflecken, die Postmedianlinie sowie die Form des Uncus und Bulbus ejaculatorius in den männlichen Genitalstrktruren. Der männlichen Holotypus befindet sich in der Sammlung von Padre Jesus S. Moure im Departamento de Zoologia, Universidade Federal do Paraná, Curitiba, Paraná, Brasilien. Der Status von *Dirphiopsis lombardi* (Bouvier, 1924) **stat. rev.** wird auf Artrang angehoben. *Dirphiopsis tripicata* (F. Johnson, 1937) **n. stat., n. syn.** wird aus der Synonymie mit *Dirphiopsis ayuruoca* genommem und neu mit *Dirphiopsis picturata* (Schaus, 1913) synonymisiert.

Notas sobre o gênero neotropical *Dirphiopsis* Bouvier, 1928 com a descrição de uma nova espécie (Lepidoptera: Saturniidae, Hemileucinae, Hemileucini)

Resumo: *Dirphiopsis* ***brockmanni*** **sp. n.,** do centro-leste brasileiro, é descrita e comparada com a espécie similar *Dirphiopsis ayuruoca* (Foetterle, 1902), do sul-sudeste brasileiro, diferindo-se desta pelo tamanho maior, pelo estigma anterior, pela linha pós-medial e pelo unco e bulbo ejaculatório da genitália masculina. O holótipo macho está depositado na coleção Padre Jesus S. Moure, Departamento de Zoologia, Universidade Federal do Paraná, Curitiba, Paraná, Brasil. O status de *Dirphiopsis lombardi* (Bouvier, 1924) **stat. rev.** é elevado ao nível específico. *Dirphiopsis tripicata* (F. Johnson, 1937) **n. stat., n. syn.** é removida da sinonímia de *Dirphiopsis ayuruoca* e colocada como um novo sinônimo de *Dirphiopsis picturata* (Schaus, 1913).

Introduction

According to Lemaire (2002), *Dirphiopsis* is known from 16 species. This species number increased to 18 in the recent years, due to new discoveries (Wolfe 2003, Decaëns et al. 2003). For Brazil, Lemaire (2002) recorded 8 species: *D. trisignata* (C. & R. Felder *in* C. & R. Felder & Rogenhofer, 1874), *D. picturata* (Schaus, 1913), *D. ayuruoca* (Foetterle, 1902), *D. epiolina* (C. & R. Felder *in* C. & R. Felder & Rogenhofer, 1874), *D. delta* (Foetterle, 1902), *D. undulinea* (F. Johnson, 1937), *D. multicolor* (Walker, 1855), and *D. wanderbilti* Pearson, 1958. (Felder authorships in the "Reise der Novara" according to Nässig & Speidel 2007.)

In the following, a new species is described, *Dirphiopsis lombardi* (Bouvier, 1924) **stat. rev.** is removed from Lemaire's synonymy and reinstated at species rank due to the reasons mentioned below, and *Dirphiopsis tripicata* (F. Johnson, 1937) **n. syn.** is replaced from synonymy in *Dirphiopsis ayuruoca* (Foetterle, 1902) to *Dirphiopsis picturata* (Schaus, 1913). Thereby the number of species recorded from Brazil raises to 10.

Collection abbreviations:

CEF	Coll. Eurides Furtado, Diamantino, Mato Grosso, Brazil.
CGCM	Coll. Carlos G. C. Mielke, Curitiba, Paraná, Brazil.
CLAM (MC)	Coll. Lepidoptera Alfred Moser, São Leopoldo, Rio Grande do Sul, Brazil.
CMN	Coll. Museu Nacional, Rio de Janeiro, Rio de Janeiro, Brazil.
COM	Coll. Olaf H. H. Mielke, Curitiba, Paraná, Brazil.
CSNB	Coll. Stefan Naumann, Berlin, Germany.
DZUP (DZ)	Coll. Padre Jesus S. Moure, Departamento de Zoologia, Universidade Federal do Paraná, Curitiba, Paraná, Brazil.
IOC	Coll. Instituto Oswaldo Cruz, Rio de Janeiro, Rio de Janeiro, Brazil.
MZSP	Coll. Museu de Zoologia, Universidade de São Paulo, São Paulo, São Paulo, Brazil.
NHMW	Naturhistorisches Museum Wien, Vienna, Austria.
USNM	U.S. National Museum of Natural History, Smithsonian Institution, Washington D.C., Unites States.

Dirphiopsis brockmanni n. sp.

Figs. 1a, 1b, 2a, 2b, 3, 4, 5, 6

Holotype ♂ with the following labels: "Holotypus, *Dirphiopsis brockmanni* C. Mielke, U. Brosch and S. Naumann det. 2007", "Brasil, Minas Gerais, Caraça, 1300 m, 1.–2. iv. 1992, V. O. Becker", "DZ 8.657", "Coleção V. O. Becker 84.933". Donated by the senior author and deposited in DZUP. Figs. 1a, 1b.

Paratypes (in total 16 ♂♂, 2 ♀♀; all **Brazil**): **Minas Gerais**: Santa Bárbara, Caraça: 1 ♂, 1 ♀ (CGCM 15.563, 14.749), same date as the holotype, ♂ with genitalia prep. 1102/04 Naumann; 1 ♂, 1 ♀ (COM 19.415, 19.416), 1. xii. 1988, O. & E. J. Mielke leg.; 7 ♂♂ (IOC), 1380 m, xi. 1961, Kloss, Lenko,

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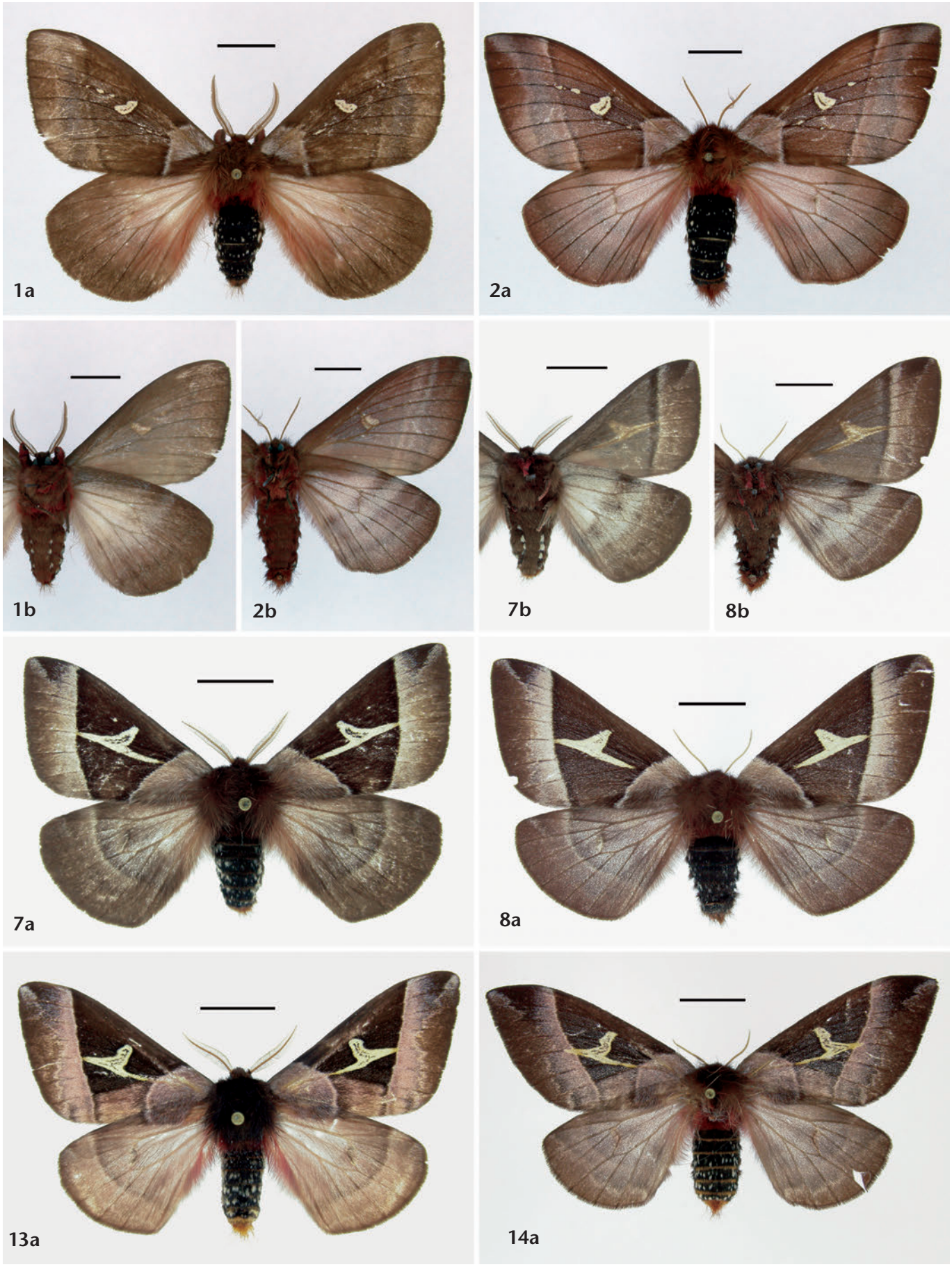

Colour plate 1: Figs. 1–2: *Dirphiopsis brockmanni* n. sp. **Fig. 1:** Holotype ♂ dorsal (**a**), ventral (**b**). **Fig. 2:** Paratype ♀ dorsal (**a**), ventral (**b**). **Figs. 7–8:** *Dirphiopsis lombardi*. **Fig. 7:** ♂ dorsal (**a**), ventral (**b**). **Fig. 8:** ♀ dorsal (**a**), ventral (**b**). **Figs. 13–14:** *Dirphiopsis delta*. **Fig. 13a:** ♂ dorsal. **Fig. 14a:** ♀ dorsal. — Specimens not to the same scale; scale = 1 cm.

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Colour plate 2: Figs. 13–14: *Dirphiopsis delta*. **Fig. 13b:** ♂ ventral. **Fig. 14b:** ♀ ventral. **Fig. 19:** Holotype ♀ *Dirphiopsis lombardi*. **Fig. 20:** Holotype ♀ *Dirphiopsis delta*. **Fig. 21:** Holotype ♂ *Dirphiopsis aphrodite*. **Fig. 22:** Lectotype ♀ *Dirphiopsis ayuruoca*. — Specimens not to the same scale; scale = 1 cm.

Martins & Silva leg.; 6 ♂♂ (MZSP 01 930, 01 931, 01 932, 01 933, 01 934, 01 935), 27. xi.–5. xii. 1972, Museu de Zoologia expedition. — **Rio de Janeiro**: 1 ♂ (NHMW), Petrópolis, 29. iv. 1911, J. G. Foetterle.

Etymology. The name is dedicated to Ernst Brockmann (Lich, Germany) to acknowledge his valuable efforts and contributions to Neotropical Lepidoptera knowledge.

Diagnosis, ♂ (Figs. 1a, 1b): Wingspan 74 mm, forewing length 40 mm (holotype; paratypes: 35–37 mm). Antennae (ca. 50 segments): bipectinate, rami dark yellow. Frons dark brown, labial palpi darker than frons and carmine apically. Thorax dorsally brown interspersed with lighter hair-like scales, ventrally lighter; in thorax a carmine and thin collar just behind head. Legs carmine brown; tibia spurs 0–2–3. The foretibia bears an epiphysis of $^3/_5$ of its length. Forewing moderately elongated, apex not pronounced, outer margin slightly convex; dorsal ground colour brown; antemedian area light gray with a posterior and transverse dark brown area; antemedial line whitish, bent at its intersection with the cubitus; median area brown with a transverse and cream coloured discal spot, this with a tiny brown center, also a week marking anteriorly on the cubitus plus some accessory dots on M_2 distally; postmedial line dark brown and slightly convex; postmedian area lighter with a wavy gray band proximately, submarginal band brown; ventrally light brown, postmedial line fawn. Baso-median area of the hindwing very light brown suffused with light carmine hair-like scales getting darker distally up to the postmedian area, coloured as on the median forewing area; discal spot almost undistinguished; ventrally the gray baso-median area well distinguished from the brown postmedian area. Abdomen dorsally black sprinkled with white dots, anteriorly with a dark carmine collar, ventrally brown, anal tuft carmine to light brown. In genitalia (Figs.

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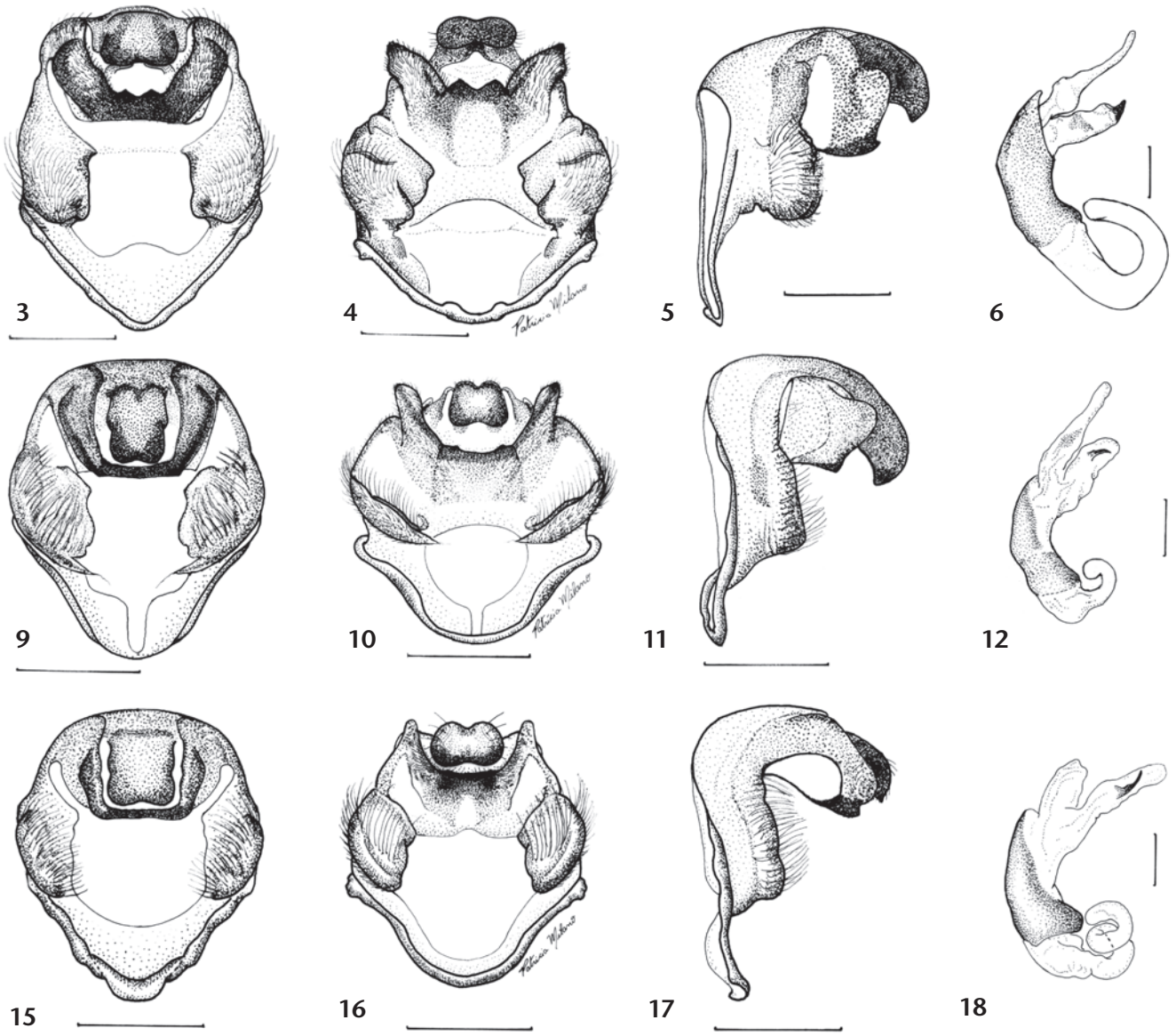

Figs. 3–6: *Dirphiopsis brockmanni* n. sp., ♂ genitalia (Holotype): ventral view (**3**), anterior view (**4**), lateral view (**5**), phallus lateral view (**6**). **Figs. 9–12:** *Dirphiopsis lombardi*, ♂ genitalia: ventral view (**9**), anterior view (**10**), lateral view (**11**), phallus lateral view (**12**). **Figs. 15–18:** *Dirphiopsis delta*, ♂ genitalia: ventral view (**15**), anterior view (**16**), lateral view (**17**), phallus lateral view (**18**). — Scales: 1 mm.

3–6) uncus simple and short, well sclerotized, enlarged and slightly bilobed at the apex, downcurved posteriorly; median plate of transtilla narrow, posteriorly concave, lateral arms slightly projected; valves reduced; saccus not pronounced anteriorly; phallus (Fig. 6) with a bulbus ejaculatorius as long as the aedeagus, once twisted, vesica bilobed with the ventral lobe apically armed with a small cornutus.

♀ (Figs. 2a, 2b): Wingspan 83–87 mm, forewing length 45–46 mm. Antennae (ca. 47 segments), bidentate. Similar to ♂; general ground colour can be reddish brown, hindwing colour without much gradient and discal spot more contrasting; ventrally, postmedial line more evident.

Immature stages. Unknown.

Discussion. *D. brockmanni* n. sp. resembles *D. ayuruoca*, but it mainly differs from the latter by the bigger size, the smaller and transverse discal spot on the forewing, the almost indistinguished discal spot on the hindwing, the less contrasting wings ornamentation, the baso-median area of the hindwing much lighter than the marginal band, the uncus broader and slightly bilobed, and the bulbus ejaculatorius once twisted instead of twice and a half times in *D. ayuruoca* (♂ with genitalia prep. no. DZ 8997 = 1100/04 Naumann).

Geographical distribution (Fig. 23). *Dirphiopsis brockmanni* n. sp. is only known from the type locality and from a unique record from Petrópolis, in Rio de Janeiro state.

Ethology: Unknown.

Dirphiopsis lombardi (Bouvier, 1924) stat. rev.

Figs. 7a, 7b, 8a, 8b, 9, 10, 11, 12.

The description of *D. lombardi* is based on a single ♀ collected by M. Lombard in August, 1912 at "Bana do Uruguay" (mentioned that way in the original description and on the locality label of the specimen, but more likely Barra do Uruguay), Paraná state [Brazil], and not

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in September as mentioned in Bouvier's description, according to the labels found with the holotype deposited in Muséum National d'Histiorie Naturelle (MNHN) in Paris, France. At that time, Paraná used to reach the Rio Grande do Sul state boundary to the South, bordered by the Uruguay River which, nowadays, belongs to Santa Catarina state. The type locality in Portuguese, Barra do Uruguay, means "Uruguay river's margin", then it should be considered as Santa Catarina, possibly Piratuba county where the railway reached that river, and not Paraná as in Lemaire (1996, 2002). For instance, this is very close to Seara Co., from where some records for this species exist.

Lemaire (1996) synonymized *D. lombardi* to *D. delta* (Figs. 13a, 13b, 14a, 14b, 15, 16, 17, 18) without further comments. Bouvier (1924) previously pointed out that *D. lombardi* differs from *D. delta* by the darker appearance, the forewing median area entirely brown, the shape of the forewing stigma, and some hindwing ornamentation. While examining nice series of these two taxa deposited in Brazilian and European collections, including the type specimens of both taxa, we could conclude that they are really different species, and no intermediate forms exist. Also, the different genitalia characters must be considered. Both ♀ holotypes are figured: *D. lombardi* (Fig. 19), and *D. delta* (Fig. 20); the first was figured in its original description in black & white only, the second was painted in colour. The lectotype of *Dirphiopsis aphrodite* (Schaus, 1915), designated by Todd (1971), while the taxon was synonymized by Draudt (1929) to *D. delta,* is figured here for the first time (Fig. 21).

Diagnosis, ♂ (Figs. 7a, 7b, 9, 10, 11, 12). It can be easily distinguished from *D. delta* by the brownish instead of pinkish general appearance, the transverse and slight convex antemedial line instead of curved, the entire brown median are instead of a well defined lighter posterior area, the more conspicuous stigma specially the anterior arm, the slightly convex postmedial line, the better marked posterior discal spot, the more relevant whitish postmedian band and, also, both arms of the transtilla more prominent, uncus slender (Figs. 9–10), and bulbus ejaculatorius shorter than phallus and less than once twisted (Fig. 12) instead of longer than phallus and twice twisted in *D. delta* (Figs. 18).

♀ (Figs. 8a, 8b). It is similar to the ♂, with typical sexual dimorphism in size and form. The postmedial line is convex in both species and the postmedian band is even more conspicuous in *D. lombardi* than in *D. delta* (Figs. 14a, 14b).

Fig. 23: Geographical distribution in Brazil.

Examined material — ***D. lombardi*** (in total 38 ♂♂, 5 ♀♀; all **Brazil**): **Rio de Janeiro**: 1 ♂ (DZ 9.027), Itatiaia, 700 m, 30. viii. 1921, Zikán & Gagarin leg.; 2 ♂♂ (DZ 8.971; 8.963), Itatiaia, 9. ix. 1958, ex col. L. Schwartz; 1 ♂ (DZ 9.019), National Park Itatiaia, 1100 m, 5. viii. 1966, N. Tangerini leg., ex col. D'Almeida; 1 ♂ (DZ 8.995), National Park Itatiaia, 850 m, viii. 1952, ex col. F. Justus Jr.; 1 ♂ (DZ 9.011), Mauá, Itatiaia, 1150 m, 26. ix. 1956, H. Ebert & Gagarin leg., ex col Gagarin; 2 ♂♂ (DZ 9.003, 8.987), Maromba, Itatiaia, 1100 m, viii. 1950, viii. 1952, ex col. F. Justus Jr.; 1 ♂ (DZ 8.979), Maromba, Itatiaia, 28. vii. 1952, Travassos, Pearson & Oiticica leg., ex col. Gagarin.; 1 ♂ (DZ 9.028), Parque Itatiaia, 800 m, 1.–2. x. 1962, D'Almeida & Mielke leg. — **Paraná**: 1 ♂ (CGCM 15.394), Campo do Tenente, 9. x. 1966, O. Mielke leg.; 1 ♂ (CEF 12.162), Lapa, 800 m, 4. ix. 1999, A. Moser leg.; 4 ♂♂ (NHMW), "Paraná–Minas". — **Santa Catarina**: 1 ♂ (CSNB), São Bento, viii. 1986, genitalia no. 1046/04 Naumann; 2 ♂♂, 1 ♀ (DZ 8.955, 8.973, 9.020), Nova Teutônia (Seara Co.), S 27°11', W 52°23', viii. 1956, viii. 1954, 4. viii. 1956, 300–500 m, Fritz Plaumann; 1 ♀ (MNHN), *Dirphia lombardi*, ♀ type Bouv., Etat de Paraná, Barra do Uruguay, viii. 1912, P. Lombard 1913, E. L. Bouvier det.; 4 ♂♂, 2 ♀♀ (CGCM 14.202, 15.350, 15.818, 16.001, 15.492, 15.611), Bom Jardim, 1500 m, 1.–4. x. 1996, V. O. Becker leg.; 2 ♂♂ (MC 0127, 0128), Lages, 1150 m, 1. ix. 1999, A. Moser leg.; 1 ♂, 1 ♀ (MC 0129, 0130), São Joaquim, 1350 m, 5. ix. 1999, A. Moser leg. — **Rio Grande do Sul**: 2 ♂♂ (MC 0124, 0125), Encruzilhada do Sul, 300–500 m, 4.–6. ix. 2004, A. Moser leg.; 1 ♂ (MC 0126), São Francisco de Paula, Rio Sta. Cruz, 650 m, 7.–8. vi. 2005, A. Moser leg. — Exact data not noted: 9 ♂♂, 1 ♀ (CMN).

Examined material — ***D. delta*** (in total 57 ♂♂, 18 ♀♀; all **Brazil**): **Espírito Santo**: 1 ♀ (DZ 9.067), Santa Teresa, 28. x. 1966, C. & C. T. Elias leg. — **Rio de Janeiro**: 1 ♀ (NHMW), *Ormiscodes delta* Foetterle, Type, Petrópolis, 1. xi. [18]99, coll. J. G. Foetterle, don. H. Ornstein 1981; 1 ♀ (DZ 9.067), Parque São Vicente, Petrópolis, 26. v. 1960, Gagarin leg. — **São Paulo**: 1 ♂ (DZ 9.051), Salesópolis, Boracea, 17. iv. 1942, ex col. D'Almeida. — **Paraná**: 1 ♂ (CGCM 18.165), Tibagi, Fortuna, 750 m, 18. v. 2005, C. Mielke leg.; 1 ♂ (CGCM 5.785), Tijucas do Sul, Vossoroca, 800 m, 3. iv. 1997, C. Mielke leg., genitalia no. 1099/04 Naumann; 1 ♂ (DZ 9.043), Ponta Grossa, vi. 1959, ex col. F. Justus Jr.; 1 ♂ (DZ 8.705), Colombo, 23. iv. 1974, O. Mielke leg.; 1 ♂ (DZ 8.697), Santa Clara, Guarapuava, 650 m, 28. iv. 1987, Casagrande & Mielke leg.; 1 ♀ (CGCM 13.975), Rio Negro, 4. v. 1991, C. Mielke leg.; 1 ♂ (USNM), "*Dirphia aphrodite* Schs, type", "Type No. 18.508 U. S. N. M.", "Curitiba, Coll. J. Arp", "Gen. prep. 4111, J. O. F., viii. 1949", "Lectotype, *Dirphia aphrodite* Schaus by E. L. Todd". — **Santa Catarina**: 7 ♂♂, 1 ♀ (CGCM 986, 1.121, 1.146, 1.481, 1.529, 1.911, 876; CSNB), São Bento do Sul, Rio Natal, 500 m, ix. 2002, 10. vi. 1998, 6. viii. 1999, 5. vi.

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1999, v. 1998, viii. 1997, vii. 2003, A. Rank leg.; 1 ♂ (CSNB), Rio Vermelho, x. 1984, genitalia no. 1045/04 Naumann; 1 ♀ (DZ 9.075), Nova Teutônia (Seara Co.), S 27°11′, W 52°23′, 4. vii. 1951, 300–500 m, Fritz Plaumann. – **Rio Grande do Sul**: 3 ♂♂ (MC 0131, 0132, 0133), São Francisco de Paula, Rio Santa Cruz, 650 m, 3.–4. vi. 2005, A. Moser leg. – Exact data not noted: 6 ♂♂, 5 ♀♀ (NHMW); 33 ♂, 7 ♀ (CMN).

Geographical distribution (Fig. 23). Although both taxa are sympatric in some regions (Seara Co. and São Francisco de Paula Co.), it appears that *D. lombardi* is more frequent at higher altitudes, while *D. delta* is more frequent at median altitudes. The former ranges from Rio de Janeiro (Mantiqueira Mountains) down to Rio Grande do Sul, the latter is more widely distributed, ranging from Espírito Santo down to Rio Grande do Sul as well. Generally, they are autumn to spring fliers (from May to October) which makes them harder to be represented in collections, especially *D. lombardi*. Corseuil et al. (2002) and Specht et al. (2005) have already registered the occurrence of *D. delta* in Rio Grande do Sul state, the latter specified as the northeastern part of the state, adding to the collecting period for this species the months April, July and August.

Dirphiopsis tripicata (F. Johnson, 1937) n. stat., syn. n.

F. Johnson (1937) described *D. tripicata* based on an unspecified number of ♂ specimens, probably a single ♂ since the author mentioned the possibility to be an aberrant of *D. trisignata*. Later, Lemaire (1996) synonymized *D. tripicata* to *D. ayuruoca*, and in 2002, the same author designated the specimen figured by Johnson as the lectotype of the species.

Examining the original description by F. Johnson, we conclude that Lemaire (1996) placed erroneously *D. tripicata* as a junior synonymy of *D. ayuruoca,* since it is, actually, a synonym of *D. picturata,* **syn. n.** The ♀ holotype of *D. ayuruoca* is figured here (Fig. 22).

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